

SEQUENCE LISTING

<110> Hua, Shao-bing
Pauling, Michelle H.
Zhu, Li

<120> HUMAN MONOCLONAL ANTIBODY AGAINST CORECEPTORS FOR HUMAN IMMUNODEFICIENCY VIRUS

<130> 25636-718

<160> 54

<170> PatentIn version 3.1

<210> 1

<211> 352

<212> PRT

<213> Homo sapiens

<400> 1

Met Asp Tyr Gln Val Ser Ser Pro Ile Tyr Asp Ile Asn Tyr Tyr Thr
5 10 15

Ser Glu Pro Cys Gln Lys Ile Asn Val Lys Gln Ile Ala Ala Arg Leu
20 25 30

Leu Pro Pro Leu Tyr Ser Leu Val Phe Ile Phe Gly Phe Val Gly Asn
35 40 45

Met Leu Val Ile Leu Ile Leu Ile Asn Cys Lys Arg Leu Lys Ser Met
50 55 60

Thr Asp Ile Tyr Leu Leu Asn Leu Ala Ile Ser Asp Leu Phe Phe Leu
65 70 75 80

Leu Thr Val Pro Phe Trp Ala His Tyr Ala Ala Ala Gln Trp Asp Phe
85 90 95

Gly Asn Thr Met Cys Gln Leu Leu Thr Gly Leu Tyr Phe Ile Gly Phe
100 105 110

Genetastix.718.ST25

```

# Phe Ser Gly Ile Phe Phe Ile Ile Leu Leu Thr Ile Asp Arg Tyr Leu
   115                               120                   125

Ala Val Val His Ala Val Phe Ala Leu Lys Ala Arg Thr Val Thr Phe
   130                               135                   140

Gly Val Val Thr Ser Val Ile Thr Trp Val Val Ala Val Phe Ala Ser
  145                               150                   155                   160

Leu Pro Gly Ile Ile Phe Thr Arg Ser Gln Lys Glu Gly Leu His Tyr
   165                               170                   175

Thr Cys Ser Ser His Phe Pro Tyr Ser Gln Tyr Gln Phe Trp Lys Asn
   180                               185                   190

Phe Gln Thr Leu Lys Ile Val Ile Leu Gly Leu Val Leu Pro Leu Leu
   195                               200                   205

Val Met Val Ile Cys Tyr Ser Gly Ile Leu Lys Thr Leu Leu Arg Cys
  210                               215                   220

Arg Asn Glu Lys Lys Arg His Arg Ala Val Arg Leu Ile Phe Thr Ile
  225                               230                   235                   240

Met Ile Val Tyr Phe Leu Phe Trp Ala Pro Tyr Asn Ile Val Leu Leu
   245                               250                   255

Leu Asn Thr Phe Gln Glu Phe Phe Gly Leu Asn Asn Cys Ser Ser Ser
   260                               265                   270

Asn Arg Leu Asp Gln Ala Met Gln Val Thr Glu Thr Leu Gly Met Thr
   275                               280                   285

His Cys Cys Ile Asn Pro Ile Ile Tyr Ala Phe Val Gly Glu Lys Phe
   290                               295                   300

```

Genetastix.718.ST25

Arg Asn Tyr Leu Leu Val Phe Phe Gln Lys His Ile Ala Lys Arg Phe
305 310 315 320

Cys Lys Cys Cys Ser Ile Phe Gln Gln Glu Ala Pro Glu Arg Ala Ser
325 330 335

Ser Val Tyr Thr Arg Ser Thr Gly Glu Gln Glu Ile Ser Val Gly Leu
340 345 350

<210> 2
<211> 17
<212> PRT
<213> Homo sapiens
<400> 2

Gln Glu Phe Phe Gly Leu Asn Asn Cys Ser Ser Ser Asn Arg Leu Asp
1 5 10 15

Gln

<210> 3
<211> 29
<212> PRT
<213> Homo sapiens

<400> 3

Glu Phe Phe Gly Leu Asn Asn Cys Ser Ser Ser Asn Arg Leu Asp Gln
1 5 10 15

Ala Met Gln Val Thr Glu Thr Leu Gly Met Thr His Cys
20 25

<210> 4
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
 <223> G4S Linker

<400> 4

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
 1 5 10 15

Gly Gly Gly Ser
 20

<210> 5
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA of G4S Linker

<400> 5
 ggccggtggtg gatcaggcgg cggaggatct ggcggagggtg gcagcgggtgg tggaggcagt
 60

<210> 6
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' Homologous Sequence

<400> 6
 accccaccaa acccaaaaaa agagatctgt atggcttacc catacgatgt tccagattac
 60

<210> 7
 <211> 57
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' Homologous Sequence

Genetastix.718.ST25

<400> 7

gagatgggtgc acgatgcaca gttgaagtga acttgcgggg tttttcagta tctacga
57

<210> 8

<211> 36

<212> PRT

<213> Homo sapiens

<400> 8

Met Asp Tyr Gln Val Ser Ser Pro Ile Tyr Asp Ile Asn Tyr Tyr Thr
1 5 10 15

Ser Glu Pro Cys Gln Lys Ile Asn Val Lys Gln Ile Ala Ala Arg Leu
20 25 30

Leu Pro Pro Leu
35

<210> 9

<211> 32

<212> PRT

<213> Homo sapiens

<400> 9

Thr Arg Ser Gln Lys Glu Gly Leu His Tyr Thr Cys Ser Ser His Phe
1 5 10 15

Pro Tyr Ser Gln Tyr Gln Phe Trp Lys Asn Phe Gln Thr Leu Lys Ile
20 25 30

<210> 10

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 10

ggagaattcg attatcaagt gtcaagtcca
30

<210> 11
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 11
cgcggtatcct tagagcggag gcaggaggcg g
31

<210> 12
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 12
ggagaattca ccagatctca aaaagaagg
29

<210> 13
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 13
cgcggtatcct tatatcttta atgtctggaa att
33

<210> 14
<211> 21
<212> DNA
<213> Artificial Sequence

<220>

<223> Primer

<400> 14

caggaattct ttggcctgaa t
21

<210> 15

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 15

cgcggtatcct cagcagtgcg tcatcccaag a
31

<210> 16

<211> 759

<212> DNA

<213> Artificial Sequence

<220>

<223> Clone 15.186.35

<400> 16

caggttacct tgaaggagtc tggctcctacg ttggtgaaac ccacacagac cctcacgctg
60

acctgcacct tgtctgggtt ctactcagc actagtggag tgagtgtggg ctggatccgt
120

cagccccag gaaaggccct tgagtggctt gcaagcataa attggaatga tgataagtgc
180

tacagcccat ctctgaaaag caggctcacc atcaccaagg acacccccaa aaaccagggtg
240

gtccttgcaa tgagcaacat ggaccctgcg gacacagcca catattcctg tgcactcgat
300

atgccccccc atgatagtgg cccgcaatct tttgatgctt ctgatgtctg gggcccaggg
360

Genetastix.718.ST25

acaatgggtca ccgtctcttc aggcgggtggt ggatcaggcg gcggaggatc tggcggaggt
420

ggcagcgggtg gtggaggcag ttcctatgag ctgatgcagc taccctcagt gtccgtgtcc
480

ccaggacaga cagccagcat cacctgctct ggagataatt tgggggataa atatgcctgc
540

tggtatcaac agaagccagg ccgggtcccct gtgctgggtca tttatggaga taacaagcgg
600

ccctcaggga tccctgagcg attctctggc tccaactctg ggaacacagc cactctgacc
660

atcagcggga cccaggctat ggatgaggct gactattact gtcaggcgtg ggacaccagc
720

actgctgtct tcggaactgg gaccaagctc accgtccta
759

<210> 17

<211> 253

<212> PRT

<213> Artificial Sequence

<220>

<223> Clone 15.186.35

<400> 17

Gln	Val	Thr	Leu	Lys	Glu	Ser	Gly	Pro	Thr	Leu	Val	Lys	Pro	Thr	Gln
1				5					10					15	

Thr	Leu	Thr	Leu	Thr	Cys	Thr	Leu	Ser	Gly	Phe	Ser	Leu	Ser	Thr	Ser
			20					25					30		

Gly	Val	Ser	Val	Gly	Trp	Ile	Arg	Gln	Pro	Pro	Gly	Lys	Ala	Leu	Glu
		35					40					45			

Trp	Leu	Ala	Ser	Ile	Asn	Trp	Asn	Asp	Asp	Lys	Cys	Tyr	Ser	Pro	Ser
	50					55					60				

Genetastix.718.ST25

```

Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Pro Lys Asn Gln Val
65                               70               75                   80

Val Leu Ala Met Ser Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Ser
85                               90                   95

Cys Ala Leu Asp Met Pro Pro His Asp Ser Gly Pro Gln Ser Phe Asp
100                               105                   110

Ala Ser Asp Val Trp Gly Pro Gly Thr Met Val Thr Val Ser Ser Gly
115                               120                   125

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
130                               135                   140

Gly Gly Ser Ser Tyr Glu Leu Met Gln Leu Pro Ser Val Ser Val Ser
145                               150                   155                   160

Pro Gly Gln Thr Ala Ser Ile Thr Cys Ser Gly Asp Asn Leu Gly Asp
165                               170                   175

Lys Tyr Ala Cys Trp Tyr Gln Gln Lys Pro Gly Arg Ser Pro Val Leu
180                               185                   190

Val Ile Tyr Gly Asp Asn Lys Arg Pro Ser Gly Ile Pro Glu Arg Phe
195                               200                   205

Ser Gly Ser Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Gly Thr
210                               215                   220

Gln Ala Met Asp Glu Ala Asp Tyr Tyr Cys Gln Ala Trp Asp Thr Ser
225                               230                   235                   240

Thr Ala Val Phe Gly Thr Gly Thr Lys Leu Thr Val Leu
245                               250

```

Genetastix.718.ST25

<210> 18
 <211> 762
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Clone 15.150.11

 <400> 18
 cagggtgcagc tgcaggagtc gggcccagga ctggtgaagc cttcggagac cctgtccctc
 60
 acttgactg tctctggtgg ctccatcggc catgactact ggagctggat acggcagccc
 120
 ccaggggagg gactggagtg gattggtttc atcttcttcg atgggagcac caactacaac
 180
 ccctccctca acggtcgagt caccatctca ctcgacacgt cgaagaatca gctctccctg
 240
 aggctgacct ctgtgaccgc tgcggacacg gccgtgtatt tctgtgagag actaaagggg
 300
 gcgtgggttat tgtctgaacc cccttacttc agctccgacg gcatggacgt ctggggccaa
 360
 gggaccacgg tcaccgtccc ctccaggcggc ggtggatcag gcggcggagg atctggcgga
 420
 ggtggcagcg gtggtggagg cagtaatttt atgtgactc agccccctc agcgtctggg
 480
 acccccgggc agagggtcag catctcttgt tctgggagca gctccgacat cggaagtaat
 540
 actgtaaact ggtaccagca actcccagga acggccccc aactcctcat ctatagtaat
 600
 aatcagcggc cctcaggggt ccctgaccga ttctctgggt tcaagtctgg cacctcagcc
 660
 tccttggtca tcagtggcct ccagtctgag gatgaggctg attattattg tgcagcatgg
 720
 gatgagagcc tgaatggtgt ggtgttcggc ggaggaccaa gg
 762

Genetastix.718.ST25

<210> 19
 <211> 254
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Clone 15.150.11

<400> 19

Gln	Val	Gln	Leu	Gln	Glu	Ser	Gly	Pro	Gly	Leu	Val	Lys	Pro	Ser	Glu	1	5	10	15
Thr	Leu	Ser	Leu	Thr	Cys	Thr	Val	Ser	Gly	Gly	Ser	Ile	Gly	His	Asp	20	25	30	
Tyr	Trp	Ser	Trp	Ile	Arg	Gln	Pro	Pro	Gly	Glu	Gly	Leu	Glu	Trp	Ile	35	40	45	
Gly	Phe	Ile	Phe	Phe	Asp	Gly	Ser	Thr	Asn	Tyr	Asn	Pro	Ser	Leu	Asn	50	55	60	
Gly	Arg	Val	Thr	Ile	Ser	Leu	Asp	Thr	Ser	Lys	Asn	Gln	Leu	Ser	Leu	65	70	75	80
Arg	Leu	Thr	Ser	Val	Thr	Ala	Ala	Asp	Thr	Ala	Val	Tyr	Phe	Cys	Ala	85	90	95	
Arg	Leu	Lys	Gly	Ala	Trp	Leu	Leu	Ser	Glu	Pro	Pro	Tyr	Phe	Ser	Ser	100	105	110	
Asp	Gly	Met	Asp	Val	Trp	Gly	Gln	Gly	Thr	Thr	Val	Thr	Val	Pro	Ser	115	120	125	
Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	130	135	140	
Gly	Gly	Gly	Ser	Asn	Phe	Met	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly				

Genetastix.718.ST25

```

145                      150                      155                      160
Thr Pro Gly Gln Arg Val Ser Ile Ser Cys Ser Gly Ser Ser Ser Asp
                165                      170                      175

Ile Gly Ser Asn Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala
                180                      185                      190

Pro Lys Leu Leu Ile Tyr Ser Asn Asn Gln Arg Pro Ser Gly Val Pro
                195                      200                      205

Asp Arg Phe Ser Gly Phe Lys Ser Gly Thr Ser Ala Ser Leu Val Ile
                210                      215                      220

Ser Gly Leu Gln Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp
225                      230                      235                      240

Asp Glu Ser Leu Asn Gly Val Val Phe Gly Gly Gly Pro Arg
                245                      250

<210>  20
<211>  750
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Clone 15.150.12

<400>  20
caggtgcagc tacagcagtg gggcgcagga ctgttgaagt cttggggaac cctgtccctc
    60

acctgcgctg tctctggtgc gtcgtttagt gggtattatt ggagctggat ccgccagccc
    120

ccagggaagg ggctggagtg gattggggag atcaatcatc gtggaagcac tacctacaac
    180

ccgtccctcg acggtcgagt caccatatca ttagacacat ctaccaacca gatctccctt
    240

```

Genetastix.718.ST25

aaactgacct ctatgaccgc cgcggacacg gccgtgtatt actgtgcgag gacagtggct
300

ggtactagtg actactgggg ccaggggaacc ctggtcaccg tttcctcagg gagtgcattcc
360

gccccaacgg gcggtggtgg atcaggcggc ggaggatctg gcggaggtgg cagcgggtggt
420

ggaggcagta aaacgacact cacgcagtct ccagcattca tgtcagcgac tccaggagac
480

aaagtcagca tctcctgcaa agccagccga gacgttgatg atgatgtgaa ctggtaccaa
540

cagagaccag gagaagctcc tatttttcatt attgaagatg ctactactct cgttcctgga
600

atctcacctc gattcagtgg cagcgggtat ggaaccgatt ttaccctcac aattaataac
660

atcgattctg aggatgctgc atattatttc tgtctacaac atgataattt cccgctcacc
720

ttcggcggag ggaccaaggt ggagatcaaa
750

<210> 21
<211> 250
<212> PRT
<213> Artificial Sequence

<220>
<223> Clone 15.150.12

<400> 21

Gln Val Gln Leu Gln Gln Trp Gly Ala Gly Leu Leu Lys Ser Trp Gly
1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Val Ser Gly Ala Ser Phe Ser Gly Tyr
20 25 30

Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Genetastix.718.ST25

```

> Gly Glu Ile Asn His Arg Gly Ser Thr Thr Tyr Asn Pro Ser Leu Asp
   50          55          60

Gly Arg Val Thr Ile Ser Leu Asp Thr Ser Thr Asn Gln Ile Ser Leu
65          70          75          80

Lys Leu Thr Ser Met Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala
      85          90          95

Arg Thr Val Ala Gly Thr Ser Asp Tyr Trp Gly Gln Gly Thr Leu Val
      100          105          110

Thr Val Ser Ser Gly Ser Ala Ser Ala Pro Thr Gly Gly Gly Gly Ser
      115          120          125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Lys
      130          135          140

Thr Thr Leu Thr Gln Ser Pro Ala Phe Met Ser Ala Thr Pro Gly Asp
      145          150          155          160

Lys Val Ser Ile Ser Cys Lys Ala Ser Arg Asp Val Asp Asp Asp Val
      165          170          175

Asn Trp Tyr Gln Gln Arg Pro Gly Glu Ala Pro Ile Phe Ile Ile Glu
      180          185          190

Asp Ala Thr Thr Leu Val Pro Gly Ile Ser Pro Arg Phe Ser Gly Ser
      195          200          205

Gly Tyr Gly Thr Asp Phe Thr Leu Thr Ile Asn Asn Ile Asp Ser Glu
      210          215          220

Asp Ala Ala Tyr Tyr Phe Cys Leu Gln His Asp Asn Phe Pro Leu Thr
      225          230          235          240

```

2 Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
 245 250

<210> 22

<211> 759

<212> DNA

<213> Artificial Sequence

<220>

<223> Clone 15.150.24

<400> 22

caggtcacct tgaaggagtc tggtcctacg ctgggtgaaac ccacacagac cctcacgctg
60

acctgcacct tctctggggtt ctactcaga actactggag aggggtgtggg ctgggtccgt
120

cagccccag gaaaggccct ggaatggctt gcactcattt attgggatga tgataagcgc
180

tacagcccat ctctgaagag caggctcacc atcaccaagg acacctccaa aaagcagggtg
240

gtccttaciaa tgaccaacgt ggaccagcg gacacagcca cctattactg tacacacgag
300

caatactatt atgatactag tggtcagcca tactactttg acttctgggg ccagggcacc
360

ctggtcaccg tctcctcagg cggtggtgga tcaggcggcg gaggatctgg cggagggtggc
420

agcggtggtg gaggcagtaa catccagggtg acccagtctc catcctccct gtctgcatct
480

gtaggagaca gagtcacat gacttgccgg gcgagtcagg acattaggaa gaatttaa
540

tggtatcagc aaaaaccagg gaaagccctt aaggctctga tctacgatgc atccgatttg
600

gaaacaggga tcccatcaag gttcagtgga agtggatctg ggacagattt tctcctcacc
660

Genetastix.718.ST25

atcagcagcc tgcagcctga agatattgca acatactact gtcaacagtc tgattattta
720

ccgctcactt tcggcggagg gaccaaagtg gatatcaaa
759

<210> 23
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Clone 15.150.24
<400> 23

Gln Val Thr Leu Lys Glu Ser Gly Pro Thr Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Arg Thr Thr
20 25 30

Gly Glu Gly Val Gly Trp Val Arg Gln Pro Pro Gly Lys Ala Leu Glu
35 40 45

Trp Leu Ala Leu Ile Tyr Trp Asp Asp Asp Lys Arg Tyr Ser Pro Ser
50 55 60

Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Ser Lys Lys Gln Val
65 70 75 80

Val Leu Thr Met Thr Asn Val Asp Pro Ala Asp Thr Ala Thr Tyr Tyr
85 90 95

Cys Thr His Glu Gln Tyr Tyr Tyr Asp Thr Ser Gly Gln Pro Tyr Tyr
100 105 110

Phe Asp Phe Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly
115 120 125

Genetastix.718.ST25

```

1 Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
   130                               135                               140

Gly Ser Asn Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser
145                               150                               155                               160

Val Gly Asp Arg Val Thr Met Thr Cys Arg Ala Ser Gln Asp Ile Arg
                               165                               170                               175

Lys Asn Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Val
                               180                               185                               190

Leu Ile Tyr Asp Ala Ser Asp Leu Glu Thr Gly Ile Pro Ser Arg Phe
                               195                               200                               205

Ser Gly Ser Gly Ser Gly Thr Asp Phe Ile Leu Thr Ile Ser Ser Leu
   210                               215                               220

Gln Pro Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Ser Asp Tyr Leu
225                               230                               235                               240

Pro Leu Thr Phe Gly Gly Gly Thr Lys Val Asp Ile Lys
                               245                               250

<210>  24
<211>  759
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Clone 15.186.35 Variant

<400>  24
caggtcacct tgaaggagtc tggctctacg ttggtgaaac ccacacagac cctcacgctg
   60

acctgcacct tgtctggggt ctcactcagc actagtggag tgagtgtggg ctggatccgt
  120

```

Genetastix.718.ST25

cagccccag gaaaggccct tgagtggctt gcaagcataa attggaatga tgataagtgc
180

tacagcccat ctctgaaaag caggctcacc atcaccaagg acacccccaa aaaccaggtg
240

gtccttgcaa tgagcaacat ggaccctgcg gacacagcca catattcctg tgcactcgat
300

atgccccccc atgatagtgg cccgcaatct tttgatgctt ctgatgtctg gggcccaggg
360

acaatgggtca ccgtctcttc aggcgggtggg ggatcaggcg gcggaggatc tggcggaggt
420

ggcagcgggtg gtggaggcag ttcctatgag ctgatgcagc taccctcagt gtccgtgtcc
480

ccaggacaga cagccagcat cacctgctct ggagataatt tgggggataa atatgcctgc
540

tggtatcaac agaagccagg ccgggtcccct gtgctgggtca tttatggaga taacaagcgg
600

ccctcaggga tccctgagcg attctctggc tccaactctg ggaacacagc cactctgacc
660

atcagcggga cccaggctat ggatgaggct gactattact gtcaggcgtg ggacaccagc
720

actgctgtct tcggaactgg gaccaagctc accgtccta
759

<210> 25

<211> 253

<212> PRT

<213> Artificial Sequence

<220>

<223> Clone 15.186.35 Variant

<400> 25

Gln Val Thr Leu Lys Glu Ser Gly Pro Thr Leu Val Lys Pro Thr Gln
1 5 10 15

Genetastix.718.ST25

```

Thr Leu Thr Leu Thr Cys Thr Leu Ser Gly Phe Ser Leu Ser Thr Ser
      20                25                30

Gly Val Ser Val Gly Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu
      35                40                45

Trp Leu Ala Ser Ile Asn Trp Asn Asp Asp Lys Cys Tyr Ser Pro Ser
      50                55                60

Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Pro Lys Asn Gln Val
65      70                75                80

Val Leu Ala Met Ser Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Ser
85      90                95

Cys Ala Leu Asp Met Pro Pro His Asp Ser Gly Pro Gln Ser Phe Asp
100     105                110

Ala Ser Asp Val Trp Gly Pro Gly Thr Met Val Thr Val Ser Ser Gly
115     120                125

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
130     135                140

Gly Gly Ser Ser Tyr Glu Leu Met Gln Leu Pro Ser Val Ser Val Ser
145     150                155                160

Pro Gly Gln Thr Ala Ser Ile Thr Cys Ser Gly Asp Asn Leu Gly Asp
165     170                175

Lys Tyr Ala Cys Trp Tyr Gln Gln Lys Pro Gly Arg Ser Pro Val Leu
180     185                190

Val Ile Tyr Gly Asp Asn Lys Arg Pro Ser Gly Ile Pro Glu Arg Phe
195     200                205

```

Genetastix.718.ST25

Ser Gly Ser Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Gly Thr
210 215 220

Gln Ala Met Asp Glu Ala Asp Tyr Tyr Cys Gln Ala Trp Asp Thr Ser
225 230 235 240

Thr Ala Val Phe Gly Thr Gly Thr Lys Leu Thr Val Leu
245 250

<210> 26

<211> 774

<212> DNA

<213> Artificial Sequence

<220>

<223> Clone 15.150.11 Variant

<400> 26

cagggtgcagc tgcaggagtc gggcccagga ctggtgaagc cttcggagac cctgtccctc
60

acttgcaactg tctctggtgg ctccatcggt catgactact ggagctggat acggcagccc
120

ccaggggagg gactggagtg gattggtttc atcttcttcg atgggagcac caactacaac
180

ccctccctca acggtcgagt caccatctca ctcgacacgt cgaagaatca gctctccctg
240

aggctgacct ctgtgaccgc tgcggacacg gccgtgtatt tctgtgagag actaaagggg
300

gcgtgggttat tgtctgaacc cccttacttc agctccgacg gcatggacgt ctggggccaa
360

gggaccacgg tcaccgtctc ctcaggcggg ggtggatcag gcggcggagg atctggcgga
420

ggtggcagcg gtggtggagg cagtaatttt atgctgactc agccccctc agcgtctggg
480

acccccgggc agaggggtcag catctcttgt tctgggagca gctccgacat cggaagtaat
540

Genetastix.718.ST25

actgtaaact ggtaccagca actcccagga acggccccc aactcctcat ctatagtaat
600

aatcagcggc cctcaggggt cctgaccga ttctctggct tcaagtctgg cacctcagcc
660

tccttggtca tcagtggcct ccagtctgag gatgaggctg attattattg tgcagcatgg
720

gatgagagcc tgaatgggtg ggtgttcggc ggaggaacca aggtgaccgt ccta
774

<210> 27
<211> 258
<212> PRT
<213> Artificial Sequence

<220>
<223> Clone 15.150.11

<400> 27

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Glu
1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Gly Ser Ile Gly His Asp
20 25 30

Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Glu Gly Leu Glu Trp Ile
35 40 45

Gly Phe Ile Phe Phe Asp Gly Ser Thr Asn Tyr Asn Pro Ser Leu Asn
50 55 60

Gly Arg Val Thr Ile Ser Leu Asp Thr Ser Lys Asn Gln Leu Ser Leu
65 70 75 80

Arg Leu Thr Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Phe Cys Ala
85 90 95

Arg Leu Lys Gly Ala Trp Leu Leu Ser Glu Pro Pro Tyr Phe Ser Ser

Genetastix.718.ST25

100

105

110

Asp Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
130 135 140

Gly Gly Gly Ser Asn Phe Met Leu Thr Gln Pro Pro Ser Ala Ser Gly
145 150 155 160

Thr Pro Gly Gln Arg Val Ser Ile Ser Cys Ser Gly Ser Ser Ser Asp
165 170 175

Ile Gly Ser Asn Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala
180 185 190

Pro Lys Leu Leu Ile Tyr Ser Asn Asn Gln Arg Pro Ser Gly Val Pro
195 200 205

Asp Arg Phe Ser Gly Phe Lys Ser Gly Thr Ser Ala Ser Leu Val Ile
210 215 220

Ser Gly Leu Gln Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp
225 230 235 240

Asp Glu Ser Leu Asn Gly Val Val Phe Gly Gly Gly Thr Lys Val Thr
245 250 255

Val Leu

<210> 28
<211> 750
<212> DNA
<213> Artificial Sequence

<220>

<223> Clone 15.150.12 Variant

<400> 28

cagggtgcagc tacagcagtg gggcgcagga ctgttgaagt cttggggaac cctgtccctc
60

acctgcgctg tctctggtgc gtcgtttagt ggttattatt ggagctggat ccgccagccc
120

ccagggaagg ggctggagtg gattggggag atcaatcatc gtggaagcac tacctacaac
180

ccgtccctcg acggtcgagt caccatatca ttagacacat ctaccaacca gatctccctt
240

aaactgacct ctatgaccgc cgcggacacg gccgtgtatt actgtgagag gacagtggct
300

gggtactagt actactgggg ccagggaacc ctggtcaccg tttcctcagg gagtgcattc
360

gccccaacgg gcggtggtgg atcaggcggc ggaggatctg gcggaggtgg cagcgggtgg
420

ggaggcagtg aaacgacact cacgcagtct ccagcattca tgtcagcgac tccaggagac
480

aaagtcagca tctcctgcaa agccagccga gacgttgatg atgatgtgaa ctggtaccaa
540

cagagaccag gagaagctcc tattttcatt attgaagatg ctactactct cgttcctgga
600

atctcacctc gattcagtg cagcgggtat ggaaccgatt ttaccctcac aattaataac
660

atcgattctg aggatgctgc atattatttc tgtctacaac atgataattt cccgctcacc
720

ttcggcggag ggaccaaggt ggagatcaaa
750

<210> 29

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Clone 15.150.12 Variant

<400> 29

Gln Val Gln Leu Gln Gln Trp Gly Ala Gly Leu Leu Lys Ser Trp Gly
 1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Val Ser Gly Ala Ser Phe Ser Gly Tyr
 20 25 30

Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Glu Ile Asn His Arg Gly Ser Thr Thr Tyr Asn Pro Ser Leu Asp
 50 55 60

Gly Arg Val Thr Ile Ser Leu Asp Thr Ser Thr Asn Gln Ile Ser Leu
 65 70 75 80

Lys Leu Thr Ser Met Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95

Arg Thr Val Ala Gly Thr Ser Asp Tyr Trp Gly Gln Gly Thr Leu Val
 100 105 110

Thr Val Ser Ser Gly Ser Ala Ser Ala Pro Thr Gly Gly Gly Gly Ser
 115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu
 130 135 140

Thr Thr Leu Thr Gln Ser Pro Ala Phe Met Ser Ala Thr Pro Gly Asp
 145 150 155 160

Lys Val Ser Ile Ser Cys Lys Ala Ser Arg Asp Val Asp Asp Asp Val
 165 170 175

Asn Trp Tyr Gln Gln Arg Pro Gly Glu Ala Pro Ile Phe Ile Ile Glu
180 185 190

Asp Ala Thr Thr Leu Val Pro Gly Ile Ser Pro Arg Phe Ser Gly Ser
195 200 205

Gly Tyr Gly Thr Asp Phe Thr Leu Thr Ile Asn Asn Ile Asp Ser Glu
210 215 220

Asp Ala Ala Tyr Tyr Phe Cys Leu Gln His Asp Asn Phe Pro Leu Thr
225 230 235 240

Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
245 250

<210> 30
<211> 759
<212> DNA
<213> Artificial Sequence

<220>
<223> Clone 15.150.24 Variant

<400> 30
caggtcacct tgaaggagtc tggctcctacg ctgggtgaaac ccacacagac cctcacgctg
60

acctgcacct tctctggggtt ctcaactcaga actactggag aggggtgtggg ctgggtccgt
120

cagccccag gaaaggccct ggaatggctt gcactcattt attgggatga tgataagcgc
180

tacagcccat ctctgaagag caggctcacc atcaccaagg acacctccaa aaagcaggtg
240

gtccttataa tgaccaacgt ggacccagcg gacacagcca cctattactg tacacacgag
300

caatactatt atgatactag tggtcagcca tactactttg acttctgggg ccagggcacc
360

ctgggtcacgc tctcctcagg cgggtggtgga tcaggcggcg gaggatctgg cggaggtggc
420

agcgggtgggtg gaggcagtaa catccaggtg acccagtctc catcctccct gtctgcatct
480

gtaggagaca gagtcacat gacttgccgg gcgagtcagg acattaggaa gaatttaa
540

tggtatcagc aaaaaccagg gaaagcccct aaggtcctga tctacgatgc atccgatttg
600

gaaacagggg tcccatcaag gttcagtgga agtggatctg ggacagattt tctcctcacc
660

atcagcagcc tgcagcctga agatattgca acatactact gtcaacagtc tgattattta
720

ccgctcactt tcggcggagg gaccaaagtg gatatcaaa
759

<210> 31
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Clone 15.150.24 Variant

<400> 31

Gln	Val	Thr	Leu	Lys	Glu	Ser	Gly	Pro	Thr	Leu	Val	Lys	Pro	Thr	Gln
1				5				10						15	

Thr	Leu	Thr	Leu	Thr	Cys	Thr	Phe	Ser	Gly	Phe	Ser	Leu	Arg	Thr	Thr
			20					25					30		

Gly	Glu	Gly	Val	Gly	Trp	Val	Arg	Gln	Pro	Pro	Gly	Lys	Ala	Leu	Glu
		35					40					45			

Trp	Leu	Ala	Leu	Ile	Tyr	Trp	Asp	Asp	Asp	Lys	Arg	Tyr	Ser	Pro	Ser
						55					60				

Genetastix.718.ST25

W Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Ser Lys Lys Gln Val
 65 70 75 80
 Val Leu Thr Met Thr Asn Val Asp Pro Ala Asp Thr Ala Thr Tyr Tyr
 85 90 95
 Cys Thr His Glu Gln Tyr Tyr Tyr Asp Thr Ser Gly Gln Pro Tyr Tyr
 100 105 110
 Phe Asp Phe Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly
 115 120 125
 Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
 130 135 140
 Gly Ser Asn Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser
 145 150 155 160
 Val Gly Asp Arg Val Thr Met Thr Cys Arg Ala Ser Gln Asp Ile Arg
 165 170 175
 Lys Asn Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Val
 180 185 190
 Leu Ile Tyr Asp Ala Ser Asp Leu Glu Thr Gly Ile Pro Ser Arg Phe
 195 200 205
 Ser Gly Ser Gly Ser Gly Thr Asp Phe Ile Leu Thr Ile Ser Ser Leu
 210 215 220
 Gln Pro Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Ser Asp Tyr Leu
 225 230 235 240
 Pro Leu Thr Phe Gly Gly Gly Thr Lys Val Asp Ile Lys
 245 250

<210> 32
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH CDR2

<220>
 <221> MISC_FEATURE
 <222> (4)..(4)
 <223> X = Asparagine or Threonine

<400> 32
 Gly Ser Thr Xaa Tyr Asn Pro Ser Leu
 1 5

<210> 33
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL CDR2

<220>
 <221> MISC_FEATURE
 <222> (3)..(4)
 <223> X3 = Asparagine or Threonine
 X4 = Threonine or Aspartic acid

<400> 33

Asp Ala Xaa Xaa Leu
 1 5

<210> 34
 <211> 127
 <212> PRT
 <213> Homo sapiens

<400> 34

Genetastix.718.ST25

Gln Val Thr Leu Lys Glu Ser Gly Pro Thr Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Leu Ser Gly Phe Ser Leu Ser Thr Ser
20 25 30

Gly Val Ser Val Gly Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu
35 40 45

Trp Leu Ala Ser Ile Asn Trp Asn Asp Asp Lys Cys Tyr Ser Pro Ser
50 55 60

Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Pro Lys Asn Gln Val
65 70 75 80

Val Leu Ala Met Ser Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Ser
85 90 95

Cys Ala Leu Asp Met Pro Pro His Asp Ser Gly Pro Gln Ser Phe Asp
100 105 110

Ala Ser Asp Val Trp Gly Pro Gly Thr Met Val Thr Val Ser Ser
115 120 125

<210> 35

<211> 106

<212> PRT

<213> Homo sapiens

<400> 35

Ser Tyr Glu Leu Met Gln Leu Pro Ser Val Ser Val Ser Pro Gly Gln
1 5 10 15

Thr Ala Ser Ile Thr Cys Ser Gly Asp Asn Leu Gly Asp Lys Tyr Ala
20 25 30

Genetastix.718.ST25

Cys Trp Tyr Gln Gln Lys Pro Gly Arg Ser Pro Val Leu Val Ile Tyr
35 40 45

Gly Asp Asn Lys Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
50 55 60

Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Gly Thr Gln Ala Met
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Gln Ala Trp Asp Thr Ser Thr Ala Val
85 90 95

Phe Gly Thr Gly Thr Lys Leu Thr Val Leu
100 105

<210> 36

<211> 126

<212> PRT

<213> Homo sapiens

<400> 36

Gln Val Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Glu
1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Gly Ser Ile Gly His Asp
20 25 30

Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Glu Gly Leu Glu Trp Ile
35 40 45

Gly Phe Ile Phe Phe Asp Gly Ser Thr Asn Tyr Asn Pro Ser Leu Asn
50 55 60

Gly Arg Val Thr Ile Ser Leu Asp Thr Ser Lys Asn Gln Leu Ser Leu
65 70 75 80

Arg Leu Thr Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Phe Cys Ala

Genetastix.718.ST25

85

90

95

2

Arg Leu Lys Gly Ala Trp Leu Leu Ser Glu Pro Pro Tyr Phe Ser Ser
100 105 110

Asp Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val
115 120 125

<210> 37

<211> 104

<212> PRT

<213> Homo sapiens

<400> 37

Asn Phe Met Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Ser Ile Ser Cys Ser Gly Ser Ser Ser Asp Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Ser Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Phe Lys Ser Gly Thr Ser Ala Ser Leu Val Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Glu Ser Leu
85 90 95

Asn Gly Val Val Phe Gly Gly Gly
100

<210> 38

<211> 116

Genetastix.718.ST25

<212> PRT
 <213> Homo sapiens

<400> 38

Gln Val Gln Leu Gln Gln Trp Gly Ala Gly Leu Leu Lys Ser Trp Gly
 1 5 10 15

Thr Leu Ser Leu Thr Cys Ala Val Ser Gly Ala Ser Phe Ser Gly Tyr
 20 25 30

Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Glu Ile Asn His Arg Gly Ser Thr Thr Tyr Asn Pro Ser Leu Asp
 50 55 60

Gly Arg Val Thr Ile Ser Leu Asp Thr Ser Thr Asn Gln Ile Ser Leu
 65 70 75 80

Lys Leu Thr Ser Met Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95

Arg Thr Val Ala Gly Thr Ser Asp Tyr Trp Gly Gln Gly Thr Leu Val
 100 105 110

Thr Val Ser Ser
 115

<210> 39
 <211> 106
 <212> PRT
 <213> Homo sapiens

<400> 39

Thr Thr Leu Thr Gln Ser Pro Ala Phe Met Ser Ala Thr Pro Gly Asp
 1 5 10 15

Genetastix.718.ST25

Lys Val Ser Ile Ser Cys Lys Ala Ser Arg Asp Val Asp Asp Asp Val
20 25 30

Asn Trp Tyr Gln Gln Arg Pro Gly Glu Ala Pro Ile Phe Ile Ile Glu
35 40 45

Asp Ala Thr Thr Leu Val Pro Gly Ile Ser Pro Arg Phe Ser Gly Ser
50 55 60

Gly Tyr Gly Thr Asp Phe Thr Leu Thr Ile Asn Asn Ile Asp Ser Glu
65 70 75 80

Asp Ala Ala Tyr Tyr Phe Cys Leu Gln His Asp Asn Phe Pro Leu Thr
85 90 95

Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 40

<211> 126

<212> PRT

<213> Homo sapiens

<400> 40

Gln Val Thr Leu Lys Glu Ser Gly Pro Thr Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Arg Thr Thr
20 25 30

Gly Glu Gly Val Gly Trp Val Arg Gln Pro Pro Gly Lys Ala Leu Glu
35 40 45

Trp Leu Ala Leu Ile Tyr Trp Asp Asp Asp Lys Arg Tyr Ser Pro Ser
50 55 60

Leu Lys Ser Arg Leu Thr Ile Thr Lys Asp Thr Ser Lys Lys Gln Val

Genetastix.718.ST25

```

65              70              75              80

Val Leu Thr Met Thr Asn Val Asp Pro Ala Asp Thr Ala Thr Tyr Tyr
              85              90              95

Cys Thr His Glu Gln Tyr Tyr Tyr Asp Thr Ser Gly Gln Pro Tyr Tyr
              100              105              110

Phe Asp Phe Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
              115              120              125

<210> 41
<211> 107
<212> PRT
<213> Homo sapiens

<400> 41

Asn Ile Gln Val Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1              5              10              15

Asp Arg Val Thr Met Thr Cys Arg Ala Ser Gln Asp Ile Arg Lys Asn
              20              25              30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Val Leu Ile
              35              40              45

Tyr Asp Ala Ser Asp Leu Glu Thr Gly Ile Pro Ser Arg Phe Ser Gly
              50              55              60

Ser Gly Ser Gly Thr Asp Phe Ile Leu Thr Ile Ser Ser Leu Gln Pro
65              70              75              80

Glu Asp Ile Ala Thr Tyr Tyr Cys Gln Gln Ser Asp Tyr Leu Pro Leu
              85              90              95

Thr Phe Gly Gly Gly Thr Lys Val Asp Ile Lys
              100              105

```

<210> 42
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Linker Sequence

<400> 42

Gly Gly Gly Gly Ser
 1 5

<210> 43
 <211> 21
 <212> PRT
 <213> Homo sapiens

<400> 43

Arg Leu Lys Gly Ala Trp Leu Leu Ser Glu Pro Pro Tyr Phe Ser Ser
 1 5 10 15

Asp Gly Met Asp Val
 20

<210> 44
 <211> 9
 <212> PRT
 <213> Homo sapiens

<400> 44

Arg Thr Val Ala Gly Thr Ser Asp Tyr
 1 5

<210> 45
 <211> 17
 <212> PRT
 <213> Homo sapiens

<400> 45

```

# 1  His Glu Gln Tyr Tyr Tyr Asp Thr Ser Gly Gln Pro Tyr Tyr Phe Asp
      1              5              10              15

```

Phe

```

<210> 46
<211> 11
<212> PRT
<213> Homo sapiens

```

```

#<400> 46
Ala Ala Trp Asp Glu Ser Leu Asn Gly Val Val
      1              5              10

```

```

#<210> 47
#<211> 9
#<212> PRT
#<213> Homo sapiens

```

```

#<400> 47
Leu Gln His Asp Asn Phe Pro Leu Thr
      1              5

```

```

<210> 48
<211> 9
<212> PRT
<213> Homo sapiens

```

<400> 48

```

Gln Gln Ser Asp Tyr Leu Pro Leu Thr
      1              5

```

```

<210> 49
<211> 30
<212> DNA
<213> Artificial Sequence

```

<220>

<223> Primer

<400> 49
ggagaattcg attatcaagt gtcaagtcca
30

<210> 50
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 50
cgcggtatcct tagagcggag gcaggaggcg g
31

<210> 51
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 51
ggagaattca ccagatctca aaaagaagg
29

<210> 52
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 52
cgcggtatcct tatatcttta atgtctggaa att
33

<210> 53
<211> 21

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 53
 caggaattct ttggcctgaa t
 21

<210> 54
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 54
 cgcggatcct cagcagtgcg tcatcccaag a
 31